

## **Basic Laboratory Skills v2.0**

Laboratory skills are a very important part of chemistry, some will say that “wet chemistry” is the most important aspect of chemistry. Knowing how to properly and safely carry out experiments is the first part of being successful in experiment implementation.

Purpose:

- 1) To become familiar with accurately dispensing volumes of liquid into a graduated cylinder.
- 2) Know how to light a Bunsen burner, boil a liquid, and filter out a precipitate.

### **Part I: Using a graduated cylinder**

1. Using a funnel in your 25ml or 50ml graduated cylinder you will add 25ml of solution “A” to the graduated cylinder.
2. First place the funnel in the graduated cylinder and place the graduated cylinder on a flat surface.
3. Carefully pour 20ml of the solution into the graduated cylinder and then add the remaining 5ml drop wise with a plastic dropper until the meniscus is at the 25ml mark.
4. Using the 10ml graduated cylinder and a plastic dropper add 4.5ml of solution “B” to the 10ml graduated cylinder. Set this aside for use in Part IV.
5. Take both solutions back to your lab bench.
6. ALWAYS add acid to water NEVER water to acid.
7. Pour the 25ml of solution “A” into a 50ml or 100ml beaker. Set this aside for use in Part IV.

### **Part II: Weighing out solids**

1. Place a weigh boat on the scale and zero/ tare it out. The scale should read “0.0g”
2. Using the scoopula remove 1.0g of  $\text{NaHCO}_3$  into the weigh boat.
3. Replace the lid to the  $\text{NaHCO}_3$  container and return to your lab bench.

### **Part III: Lighting a Bunsen burner**

1. Make sure gas valve is completely perpendicular to nozzle and ensure that Bunsen burner tubing is not cracked, damaged or kinked.
2. Turn gas valve so that it is parallel with gas nozzle.
3. Place flint striker over top of Bunsen burner and spark until flame is ignited. Do not let gas remain on for more than 20s while lighting.
4. Once lit adjust flame with gas/ air valve on burner or gas valve to regulate flow.
5. Each person needs to practice turning gas on, lighting burner, and turning gas off.

## ***CLASS COPY DO NOT REMOVE OR WRITE ON***

### **Part IV: Boiling a liquid**

1. Set up an iron ring stand to heat a liquid or to heat a solid
2. The iron ring should be secured to the iron ring stand about 8-12cm above the height of the Bunsen burner.
3. A piece of wire gauze should be placed on top of the iron ring
4. Place the beaker with solution "A" on the wire gauze. Sketch the set up you have in front of you.
5. Light the Bunsen burner
6. Use the thermometer to bring the solution to 60°C and then add the 1.0g of  $\text{NaHCO}_3$ .
7. Continue to heat to a light boil.
8. Let solution "A" boil for 60s then turn the Bunsen burner off.
9. Use your beaker tongs to take the hot beaker off the iron ring set up and set on your lab bench. If you need to use two (2) hands with the beaker tongs. Make sure you are careful because the contents of the beaker are very hot.
10. Add the 4.5ml of solution "B" to the warm solution "A."
11. Let new solution cool and leave undisturbed for 5min.
11. Record all observations

### **Part V: Filter**

1. Obtain a piece of ~7.5cm general use laboratory filter paper and fold it as directed previously in class.
2. Place your clean funnel in a 125 or 250mL Erlenmeyer flask then insert your filter paper. Pre wet the paper with your DI water rinse bottle.
3. Begin to filter out the solids from your solution in Part IV. Use your DI water rinse bottle and scoopula to wash any remaining solid from beaker to filter paper. Once all solution has passed through filter paper into flask, remove filter paper and carefully transfer it to designated location to dry overnight.
12. Dispose of filtrate (liquid in Erlenmeyer Flask) in the sink with the water running. Rinse and clean all glassware.
13. Clean all of your glass wear and put everything away.

***CLASS COPY DO NOT REMOVE OR WRITE ON***

***CLASS COPY DO NOT REMOVE OR WRITE ON***

**Analysis/ Post Lab Questions:**

1. What are three (3) issues that can go wrong when measuring liquids into a graduated cylinder?
  - a. Why is a graduated cylinder more accurate than a beaker for measuring liquids?
  - b. If you needed to measure out 15mL of a solution which graduated cylinder would be best and why, 10mL, 25mL, 50mL, or 100mL
2. When using a scale to mass out solids what are the steps to do so? (3-4 steps, assume you are using weigh paper)
3. Before using the Bunsen burner what should you make sure is in good conditions?
4. What did you find most difficult when lighting a Bunsen burner.
5. You should always add \_\_\_\_\_ to water and not water to \_\_\_\_\_.
6. When moving a beaker with hot liquid in it, what tool should you use? How should you use it to be safe?

***CLASS COPY DO NOT REMOVE OR WRITE ON***